

SOME NOTES ON THE EVANIIDAE AS HOUSEHOLD PESTS AND AS A FACTOR IN THE CONTROL OF ROACHES

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The Evaniidae, or ensign wasps, constitute a family of Hymenoptera represented by a relatively small number of species, which as far as is known are parasitic during their immature stages in the egg capsules of cockroaches. These parasites are thus a factor in the natural control of these pests, and the presence of the parasites in a building will usually denote the presence of cockroaches. The adult Evaniidae are medium sized black or reddish black wasps that are readily distinguished by the shape of the abdomen, which is modified so that it resembles a small flag or ensign.

The adult wasps do not normally attract attention because they are small, dark colored insects, which resemble somewhat an ordinary house fly when casually observed. To a person familiar with insects they are readily recognizable, because of the long hind legs and the small modified abdomen. When the proper environmental conditions are present, and there is an abundance of cockroaches, certain species of these wasps will increase greatly in numbers, and may become pests.

It was interesting to the writer, that for a period of several months during 1951, a family living in Worthington, Ohio, complained a great deal about the evaniid wasps which they would find in the windows and other areas of their home. The wasps annoyed them by their presence, but they did not seem to mind the Oriental roaches which could be found in abundance in the basement of their home. On another occasion in a barber shop in Columbus, Ohio, the barber was observed by Dr. D. M. DeLong of The Ohio State University, using a fly swatter to kill what he considered to be flies. These insects were identified by Dr. DeLong as Evaniidae which were parasitizing the roaches in the basement underneath the shop, and actually aiding in the control of these pests.

The annoyance of these wasps is due mostly to their habits as adults, because during this period of their life cycle, they are very active and move about a great deal by walking and flying short distances. This activity is carried on in the daytime as well as at night, and for this reason they are often noticed when their hosts are not. The annoyance caused by these wasps is due to a dislike of insects rather than any harm that is actually done, because the parasites, as far as is known, do not bite or sting.

The Evaniidae can be classified biologically into two groups, those that parasitize the egg capsules of domestic roaches, and those that attack the egg capsules of wood-roaches. Two species of Evaniidae are known to attack domestic roaches in the United States, these are *Prosevania punctata* (Brullé) and *Evania appendigaster* (Linn.). Both of these species are believed to have been introduced into this country along with their hosts. There are in addition, several species of Evaniidae that are native to the Nearctic region, and data from available rearing records show them to be parasitic in the egg capsules of our native species of wood-roaches.

Prosevania punctata (Brullé) is the most common evaniid found in Ohio, it has been found by the writer in abundance in several buildings. When the roaches were cleared from these buildings the wasps also disappeared. This is due of course to the elimination of the host, and because the new organic insecticides which are now in use seem to be just as effective in killing the parasites as they are in killing the host. These parasites are especially vulnerable because they walk

about a great deal in the areas of the home which are normally sprayed in roach control. It will be interesting to observe what effect the new insecticides will have on the future abundance of these parasites. When a building which was known to contain evaniids was sprayed with 0.5 percent chlordane solution, a survey was made of the premises daily for several days afterwards, during this time several dead wasps were found, along with numerous Oriental cockroaches. As no dead wasps had been found previously, the death of the parasites was probably due to the insecticide.

Adult Oriental and American cockroaches deposit their egg capsules in corners or crevices, and it is usually some days before the nymphal roaches emerge from them. It is during this period of egg incubation, after the capsules are deposited, that the adult evaniid wasp seeks out and parasitizes them. The female *Prosevania punctata* deposits a single egg inside the cockroach egg capsule by inserting her ovipositor through the hard outer covering. All of the immature stages of the wasp are then spent inside of the cockroach egg capsule, and the adult emerges completely developed. There are usually from three to four generations of *Prosevania punctata* per year.

In studies of wood-roach egg capsules collected under natural conditions in the field during 1951, it was found that evaniids of the genus *Hyptia* were parasitizing as high as 6.7 percent of the capsules of our native species of roaches. *Hyptia thoracia* Blanchard, was found to overwinter inside of the egg capsule as larvae and this species appear to have a single generation per year.

Examinations made of egg capsules after the adult evaniid wasps have emerged demonstrates a similarity in appearance and the result of parasitism. The entire contents of the egg capsule are consumed during the period of larval feeding. Each evaniid larva thus destroys anywhere from 8 to 40 potential roaches, according to the species parasitized.

The evaniid adults differ markedly from the larvae in their choice of food. As has previously been stated the larvae act as egg predators in the cockroach egg capsule, while the adults have been observed feeding on flowers. Some adult *Prosevania* have been kept alive in the laboratory cultures for approximately 20 days by feeding them on 5 percent honey water. As far as is known, no attempt has been made to utilize these parasites as biological control agents for roaches.

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